

"It Was Like Jail"

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During half of the Laboratory's 50-year history, there was an Atomic Vapor Laser Isotope Separation (AVLIS) Program. Starting with a handful of people in 1974, the AVLIS Program grew to 500 members in the 1990s. Today, the AVLIS alumni are contributing to virtually all of the Lab's programs. Recently, a small group got together to reminisce about a pivotal event in the AVLIS saga.

We'll never forget that famous "Thanksgiving briefing" in 1983. The Department of Energy had announced that it wanted to pursue building an isotope separation plant. Here at Livermore, the AVLIS project had already been going along for 8 or 9 years, and it was becoming a fairly significant program of scientific discovery and technology development. There was a competing program in Los Alamos and another at Oak Ridge.

Now DOE wanted to build a plant that would provide a low-cost, environmentally sound method to enrich uranium for the country, so the Department opened it as a contest between the three laboratories. At the Thanksgiving briefing, the question was asked: Could we build a full-sized laser and separator facility on short notice? Could we design, build, activate, operate, and do a convincing demonstration in 1 year?

We didn't have a big laser, we didn't have a building that size, and we didn't have enough money. We would have to build the facilities to build the lasers. We would have to put in another pipeline across the Lab from the Laser building all the way over to the Mars isotope separator facility. We would have to put a building together, design the lasers, put them in, install them, turn them on, and do separation—all in 14 months.

We said, "Sure! Why not?" And the Demo '85 race was on. We had 14 months to prove that our process worked on a significant scale.

When we were in the thick of Demo '85, every few months we had to go somewhere like Los Alamos, Oak Ridge, or Washington to do battle. These battles were like courtroom settings, only they weren't anywhere near as well behaved as courtrooms we're familiar with. In a normal courtroom today, you know almost everything the other side is going to say before you get in there. But in our "trials," we didn't know anything the other side was going to say. It would be set up so that in

the morning, both sides would attack each other, and then you'd have the lunchtime to figure out your defense. In the afternoon, you'd have an hour to defend yourself on the issues raised in the 2-hour attack you withstood in the morning.

The Demo '85 team worked, on average, 100 hours a week for a year. It was horrible, but at the same time, it was a lot of fun. It was incredible. There was a real camaraderie among all of the team members. We were working so much that we had a cafeteria serve us meals. Every day at 6:00 p.m., the food trucks would come up, and we would line up. We'd hand them our plate, and they'd slop food on it. It was like jail. But we won the competition and got the contract, and that is really due to how heroic our people were.

For people who worked on AVLIS their entire career, it was a real disappointment in 1999 when AVLIS was stopped. But even though the transitions afterward were painful, in the long run, AVLIS has been very beneficial to both the Lab and the employees. AVLIS employees were able to develop the skills necessary to deploy big projects at a fast pace. Those skills are now being used in the Defense and Nuclear Technologies, Nonproliferation, Arms Control and International Security, and National Ignition Facility directorates.

During Demo '85 and later during the demonstrations of the '90s, we used to tell our AVLIS team that yes, this seems like hell, but we were being transformed into a team that knows how to "grok" the whole problem, can work together to solve almost any issue, and can deliver its product. These are life experiences from which we benefited. AVLIS was kind of like boot camp: a two-decade-long boot camp.



AVLIS Demo '85 building.

A Brilliant Effort

Steve Mooney

"Brilliant Pebbles" were small, light-weight and low-cost space-based interceptors designed to knock out strategic missiles by colliding with them at very high speeds. Lowell Wood presented President George H. W. Bush with a model of a Brilliant Pebble during his 1990 visit, thanks to the superhuman efforts of his group. Mooney tells it best.

The day before President Bush was to arrive at the Lab, Dick Spears came running over in a panic. Lowell Wood had decided that he wanted to give the President a model of a Brilliant Pebble as a gift. So we had a day to make a 1/8th-scale model of a Brilliant Pebble—as realistically as possible.

We started pulling out little bits and pieces and all the prototype stuff. I grabbed two guys and said, "You're gonna be here for a while." Dick was making sketches and trying to scale down the dimensions for us. Every so often, Lowell would walk

in, look at what we had, and say, "Oh yeah, add this to it."

We finally, frantically, got the model done. The real thing was going to have a solar panel that supplies energy. So we took a piece of black-plastic Lexan, put it in the middle, and cut little grooves in it so it looked like little squares on a solar panel. It looked really nice. Then we had to paint it, because the designed Brilliant Pebble was gold.

So by the time morning arrived, the President's helicopter was landing, and Dick was still painting this thing. Once he finished, we put it all together and screwed in the little thrusters and added the little notes to it, and had a little Star Tracker camera on top. It looked really good. Dick screwed it to the base and had the guys make a little tag that says "1/8th scale," and "Brilliant Pebble presented to President George Bush."

But it was still wet. Dick, now in a fresh panic, said, "Geez, I've got to get this paint dry!" Meanwhile, the President was in the limo going to Building 111 for

the presentation. One of the guys ran over to a little microwave oven, threw the thing in, and turned it on. We waited and waited and waited, for what seemed an eternity. By this time, the President was getting out of his limo. Okay, Dick decided, it should be dry, so he pulled it out. But we had left the solar panel piece on top, which was plastic, and the wonderful little panel flopped over in a complete 180-degree curve. Three guys had been working all night on this thing, the President was on his way to Building 111, and Dick just freaked out. Luckily, he was able to pull the thing out while it was still hot, and he laid it down on its side, so the plastic can dry flat.

Precious minutes had disappeared by this time. Once it was flat, Dick grabbed the model and sprinted over to B11. But once he arrived, he was practically mauled by the Secret Service. It hadn't dawned on him that they were going to be there. "Where do you think you're going?" they asked him. "This is for the President!" he gasped. "Yeah, right," they said, and hauled him off.

Dick spent the next few minutes convincing them that he was there to give the President a gift. Finally, they believed him, but then they said, "Well, you can't give that to the President. We have to go through it."

So anything that Dick could unscrew on the model, he had to unscrew, to show them that there was nothing in it. Just as he finished putting it all back together, he ran over to the curtain behind the podium. As he approached the opening in the curtain, a hand literally reached in and grabbed the model to hand to the President.

Afterward, it was cool because it was on the front page of the local paper with a picture of Lowell Wood handing George Bush this little model. But looking at that photo, we could only think, "If people only knew. . . ."



Lowell Wood presenting the Brilliant Pebble to President George H. W. Bush in 1990.